

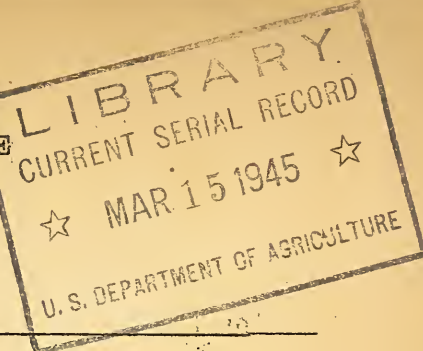
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I N S E C T P E S T S U R V E Y

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THE FIELD STATUS OF PARASITES OF THE EUROPEAN CORN
BORER AT THE CLOSE OF THE 1943 SEASON

By Charles A. Clark, entomologist
Division of Cereal and Forage Insect Investigations

Larvae of the European corn borer in which the parasites pass the winter, were collected at the close of the 1943 season in localities where exotic species were known to be established or where recent releases had been made. The survey was conducted to obtain information on the establishment, dispersion, and general field status of introduced parasites. Sample collections were procured from 17 localities in eleven states including Massachusetts, Rhode Island, Connecticut, New Jersey, Delaware, Virginia, Ohio, Michigan, Indiana, Illinois, and Wisconsin ¹/₁. Collected material was held in cold storage until early in 1944 when the parasites were reared out. Table 1 is a summary of the results of these rearings.

Middlesex County, Massachusetts

Parasitization of the borers observed from the Middlesex County, Massachusetts averaged 6.0 percent, by exotic species. The principal parasite is the ichneumonid, Inareolata punctoria Roman, but 10 specimens of the tachinid Lydella grisescens R. D. were also reared. Six clusters of cocoons of the braconid Macrocentrus gifuensis Ashm. were recovered showing that this recently established species is able to maintain itself in this environment.

Southeastern New England

Parasitization of the 2080 borers observed from this territory of approximately 4,800 square miles was found to be 20.4 percent by exotic species at the close of 1943 compared to 12.0 percent recorded at the close of 1942. Macrocentrus gifuensis was the most important parasite and had parasitized 16.3 percent of all borers observed but was most abundant in southeastern Massachusetts. Inareolata punctoria parasitized 2.3 percent of the borers observed but was more abundant in northeastern Massachusetts than in other parts of the territory. Lydella grisescens and Chelonus annulipes Wesm. were the other exotic parasites recovered but both were scarce.

¹/₁ Collections of borers from Delaware, Virginia, Illinois, and Wisconsin were obtained through the cooperation of entomologists in those states.

Table 1. -Summary of European corn borer parasitization by exotic species in various localities, close of 1943.

State	Locality	Sq. miles surveyed	Number samples	Number borers	Percent parasitization by:						
					Lydella grisescens	Inareolata punctoria	Chelonus annulipes	Macrocentrus gifuensis	Eulophus viridulus	Total exotic	
Mass.	Middlesex	36	72	1,886	0.5	5.2	0	0.3	0	6.0	
Mass.-R.I.	Eastern	4,800	56	2,080	1.2	2.3	0.6	16.3	0	20.4	
Mass.-Conn.	Central	3,800	41	2,092	1.2	6.8	0	3.6	0	11.6	
New Jersey	Burlington	254	57	3,270	12.6	T 1/	0	0.1	-	12.7	
Atlantic	Monmouth	79	22	1,285	2.7	2.1	0.2	5.4	-	10.4	
Delaware	New Castle	1	1	185	2.7	0	0	0	-	2.7	
Pencader	Kent	1	1	228	0.0	0	0	0	-	0.0	
Stockley	Sussex	79	13	723	15.1	0	0	0	-	15.1	
Stockley	Sussex 2/	1	1	199	8.0	0	0	0	-	8.0	
Virginia	Princess Anne	7	12	555	13.9 3/	0	0	0	-	13.9	
Back Bay	Accomac	7	6	354	0.0	0	0	0	-	0.0	
Lee											
Ohio	Lucas	12	12	693	32.2	0	0	0	2.0	34.2	
Jerusalem	Erie	7	9	454	11.7	0	0	0	0.4	12.1	
Perkins											
Michigan	Monroe	7	7	361	23.0	0	0	0	0.3	23.3	
Erie											
Indiana	Tipton	7	12	566	0.0	0.5 4/	0	0	-	0.5	
Wild Cat											
Illinois	Kankakee	7	9	824	0.0	0	-	0	-	0.0	
Saint Anne	Vermilion	7	9	572	0.0	0	-	0	-	0.0	
Grant											
Wisconsin	Sheboygan	1	2	158	0.0	0	-	0	-	0.0	
Wilson		9,113	342	16,485							

1/ T - Trace, less than 0.1 percent

2/ Supplementary collection

3/ 218 fall emerged L. grisescens were observed while collecting 555 larvae. Only laboratory rearings are included in this table.

4/ First recovery of L. punctoria from this locality.

Parasitization of borers observed was 1.2 percent by the former species and only 0.6 percent by the latter. The native parasite Bassus agilis Cresson had parasitized 0.3 percent of the larvae observed.

In a territory of approximately 2,000 square miles centered around Taunton in southeastern Massachusetts, parasitization of the 1130 borers was 31.8 percent compared to 19.7 percent parasitization of borers observed in 1942. Macrocentrus gifuensis was by far the most important parasite and had parasitized 23.8 percent of the larvae collected compared to 16.4 percent in 1942. Lydella grisescens and Inareolata punctoria continued to decline in effectiveness but Chelonus annulipes was again recovered in small numbers.

The most important fact brought out in this survey is the greatly increased size of the territory from which Macrocentrus gifuensis was recovered. It has been reared from collections made in Georgetown, Ipswich, Danvers; Essex, and Peabody townships in Essex County; from Woburn, Waltham, Lexington, Concord, and Sudbury townships in Middlesex County; and from Northbridge, Grafton, and Uxbridge townships (latter two townships in 1942) in southeastern Worcester County as well as from older known points of establishment. These newer recoveries increase the area from which this braconid may be recovered by approximately 1,000 square miles over that of 1942 to a total of approximately 3,200 square miles. The distribution of Macrocentrus gifuensis in this locality is now roughly as follows: All of Essex County, the southeastern half of Middlesex County, the southeastern eighth of Worcester County, and all of Suffolk, Norfolk, Bristol, Plymouth, and Barnstable counties in Massachusetts and Bristol and Newport counties in Rhode Island.

Connecticut River Valley

Parasitization of all borers observed was 11.6 percent by exotic parasites compared to 8.3 percent from a somewhat smaller survey in 1942. Inareolata punctoria was the parasite most commonly reared and had parasitized 6.8 percent of the borers observed. In some collections it showed over 25 percent parasitization of the overwintering borers. Lydella grisescens is present and widely dispersed in the Connecticut River Valley but is not particularly effective.

Macrocentrus gifuensis continues to increase in numbers and in the size of the area in which it may be found in central Connecticut. A total of 76 cocoon clusters of this parasite was produced from the 2092 borers observed or a parasitization of 3.6 percent. In 1942 only 10 cocoon masses or 0.3 percent parasitization was recorded for this parasite. This parasite is now present in Connecticut from Long Island sound north to the center of the state, east to New London and Willimantic and west to New Haven, Middletown, and Hartford, an area of approximately 1,100 square miles. Macrocentrus gifuensis was also recovered at the parasite release point at Agawam in Hampden County, Mass. Chelonus annulipes was not recovered from the Connecticut River Valley at the close of 1943.

Atlantic Township, Monmouth County, New Jersey

Four exotic parasites, Lydella Grisescens, Inareolata punctoria, Macrocentrus gifuensis and Chelonus annulipes are established in Monmouth County. The first two species remain in approximately the same status as in

1942, each species showing parasitization of two or three percent. C. annulipes is present but of no importance, only two specimens having been recovered. M. gifuensis, however, continues to increase and had parasitized 5.4 percent of the borers observed at the close of 1943 compared to 3.1 percent at the close of 1942.

Burlington County, New Jersey

The tachinid Lydella grisescens is well established in this locality. It was reared from all but two of the 57 collections. Parasitization of the borers by this fly was 12.6 percent, being considerably lower than the 17.5 percent recorded for the same territory at the close of 1942.

Two specimens of the native Bassus agilis and one specimen of Hoplocryptus bituminosus (Cush.) were reared from the borers collected in this locality.

Pencader Township, New Castle County, Delaware

Parasitization of borers collected in this locality by Lydella grisescens was 2.7 percent. Macrocentrus gifuensis was not recovered.

Dover, Kent County, Delaware

Macrocentrus gifuensis was released at this locality in 1941, but no recoveries were obtained from the 228 host larvae observed in 1943.

Stockley, Sussex County, Delaware

A total of 723 overwintering corn borer larvae collected at this parasite release locality produced 109 Lydella grisescens or 15.1 percent parasitization.

An additional supplementary collection of 199 corn borer larvae produced 16 parasites or 8.0 percent parasitization by this fly. The parasites were found to be about as numerous six miles from the release point as at the actual liberation site which would indicate that the parasite has dispersed well beyond the limits of the area covered by this survey.

The establishment of Lydella grisescens at the Stockley, Sussex County, Delaware release locality was secured from the liberation of 197 adults of both sexes on June 14, 1941.

Accomac County, Virginia

A total of 354 borers was collected in this locality but not a single parasite was reared from the material. Apparently Lydella grisescens, once common here and parasitizing over 10 percent of the overwintering larvae, has completely disappeared or is so scarce as to be not readily recoverable.

Princess Anne County, Virginia

Lydella grisescens is well established in this locality. It had parasitized 13.9 percent of the 555 overwintering borers collected at this point.

This is considerably below the 21.3 percent recorded from overwintering larvae at the close of 1942.

A total of 218 puparia presumed to be the imported parasite Lydella grisescens were observed while collecting the overwintering borers. These parasites added to those reared from the host larvae would increase the recorded parasitization to 38.2 percent.

Perkins Township, Erie County, Ohio

The two exotic parasites Lydella grisescens and Eulophus viridulus Thoms. were again recovered from this locality. The latter species is very scarce and unimportant. Less than one percent of the observed hosts had been parasitized by this species.

The tachinid had parasitized 11.7 percent of the hosts observed. Approximately one third of these parasites had issued in the fall of the year, the remainder being immature larvae in the overwintering borers. The 11.7 percent parasitization in this locality is the lowest recorded for several years and is in contrast with the 29.5 percent recorded for the same locality at the close of 1942.

Jerusalem, Lucas County, Ohio

Lydella grisescens averaged 32.2 percent parasitization of the borers observed at the close of 1943 compared to 24.6 percent of those observed at the close of 1942. The parasite was recovered from every collection made. Eulophus viridulus had parasitized 2.0 percent of the borers observed in 1943 compared to 1.5 percent of those collected at the close of 1942. It was recovered from 8 of the 12 collections and in as many of those away from the lake as close to it.

Erie Township, Monroe County, Michigan

One cluster of Eulophus viridulus was collected at the Erie Township, Monroe County, Michigan parasite release point. Parasitization by the tachinid Lydella grisescens was 23.0 percent.

Wildcat Township, Tipton County, Indiana

Three specimens of the imported ichneumonid Inareolata punctoria were reared from the 566 larvae collected at this point at the close of 1943. This was the first time this parasite has been recovered at this locality but it can not be considered to show permanent establishment since releases of this species were made in both 1942 and 1943. Neither Macrocentrus gifuensis released in 1942 and 1943 nor Lydella grisescens released in 1943 was recovered from the collections made in the fall of 1943.

Other Localities

Lydella grisescens, Macrocentrus gifuensis and Inareolata punctoria were released in Sheboygan County, Wisconsin and Vermilion County, Illinois in 1942 or 1943 and the first two species in Kankakee County, Illinois in 1943, but none of these parasites was recovered from these localities in collections made in the fall of 1943.

